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EXAMINER	
DUDEK JR, EDWARD J	

ART UNIT	PAPER NUMBER
2186	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/694,115	AMIR ET AL.	
	Examiner	Art Unit	
	Edward J. Dudek	2186	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 November 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *38-48,50-56,68 and 80-86* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *38-48,50-56,68 and 80-86* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This Office Action is responsive to the amendment filed on 26 November 2008 in application #10/694,115.

Claims 38-48, 50-56, 68 and 80-86 are pending and have been presented for examination.

Claims 1-37, 49, 57-67, 69-79, and 87-97 have been cancelled.

Response to Arguments

Applicant's arguments with respect to claims 38-48, 50-56, 68, and 80-86 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 38 and 68 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: the iSCSI interface and the IP network. The first step of the method is "… initiating an internet small computer storage interface (iSCSI) …" but this interface is never used in the method. All the data and commands are transmitted over an internet protocol (IP) network. It is not clear why this iSCSI interface is initiated if the interface is never used.

Claims 39-48 are also deficient as they depend from claim 38.

Claims 38, 68, and 80 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: what the result of the determining step is used for. Claim 38 contains the limitation "… determining, using a check point list, the amount of data to be transferred across said IP network, wherein the check-point list includes a linked list of data chunks…" There are no limitations in the claim that make use of this determination step. It is not clear why the determination is made if the results of the determination are never utilized in the claimed method.

Claims 39-48 and 81-86 are also deficient as they depend from claims 38 and 80 respectively.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 68 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claim 68 contains the limitation "A computer executable code for performing a plurality of virtualization services on a recordable media…" It is not clear from this limitation if the computer executable code is *stored* on a computer readable media. This limitation can be interpreted as having the virtualization services performed on a recordable media. It is suggested this limitation

be amended to read "A computer executable code, stored on a recordable media, for performing a plurality of virtualization services…"

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 38-48, 50-56, 68, and 80-86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuik (**U.S. Patent #7,188,194**) in view of Bono (**U.S. Patent Application Publication #2004/0107318**) and Edsall (**U.S. Patent Application Publication #2003/0172149**).

As per claim 38: Kuik discloses A method for performing a plurality of virtualization services, said method being further operative to perform said virtualization services within a data path, comprising: initiating a internet small computer storage interface (iSCSI) with at least an initiator host **(see column 4, lines 35-43)**; receiving a logic command from said initiator host over an internet protocol (IP) network **(see column 4, lines 44-58)**, said logic command including at least a virtual address of at least one virtual volume **(see column 6, lines 1-7)** determining if said initiator host is authorized to execute said logic command; denying said logic command from said

initiator host is said initiator host is unauthorized **(see column 5, lines 1-21)**; parsing said logic command to determine at least said virtual address and said logic commands type **(see column 6, lines 21-42 and column 10, lines 15-35)**; translating, in one pass, said logic command to a list of physical commands, wherein each of said physical commands is targeted to a different storage device **(see column 6, lines 1-7, each logical target can be mapped to more than one physical storage device, and column 10, lines 15-35)**; wherein the translation is performed using a mapping information including at least the relations between said at least one virtual volume and its respective logical units (LU's) and storage devices **(see column 6, lines 8-16)**; and executing said physical commands on said storage devices **(see column 7, lines 30-34)**. Kuik fails to disclose the limitation of performing a check to determine if said logic command is valid and generating a response command if said logic command is invalid. Having a system perform a check on commands that the system receives to determine if the command is valid is well known in the art, and Official Notice is hereby taken. The system would need to check every command it receives since the system would only be capable of processing commands that are known, valid, and not ones that are unknown, invalid. It would have been obvious to a person having ordinary skill in the art to which said subject matter pertains to have modified the system disclosed by Kuik to determine if the received commands are valid or invalid and to notify the sender if an invalid command is received. Kuik still fails to disclose adding said logic command to a host-logical unit (LU) queue. Edsall discloses storing frames that are going to be transmitted to the storage devices in a queue (**see [0059]**). Storing the packets in a queue as

opposed to directly transmitting them to the storage device allows the storage network to implement a quality of service (**see [0059]**). It would have been obvious to a person having ordinary skill in the art to which said subject matter pertains to have modified Kuik to include a queue to store the packets that are going to be sent to the storage devices, as disclosed by Edsall, to allow the system to implement a quality of service guarantee. The combination of Kuik and Edsall still fail to disclose determining, using a check point list, the amount of data to be transferred across said IP network, wherein the check point list includes a linked list of data chunks. Bono discloses a technique to increase the performance for accessing a disk array that is attached to a data network through the use of a special data cache arrangement that organizes the data in the cache as a linked list of data chunks **(see [0005]-[0006])**. The cache memory contains a multiple memory list elements that are used to send and receive data instead of copying multiple data fragments **(see [0036])**. These elements are lists of data chucks that together make up a cache line **(see [0038])**. The system is able to determine how much data is going to be sent across the network through the use of these linked lists **(see [0040]-[0042])**. It would have been obvious to a person having ordinary skill in the art to which said subject matter pertains to have modified the combination of Kuik and Edsall to use the novel cache arrangement disclosed by Bono to reduce the performance penalty of accessing a storage array across a data network.

As per claim 39: the combination discloses said response command comprises and iSCSI service response code indicating the type of generated error (**see Kuik**

column 4, lines 35-43) *since the system uses the iSCSI protocol, it is inherent that the response would be in the form of an iSCSI service response code*).

As per claim 40: the combination discloses said host-LU queue comprises logic commands requested to be executed by said host on said LU (**see Edsall [0058]-[0059]**).

As per claim 41: the combination discloses selecting said logic command to be executed from said host-LU queue (**see Edsall [0059]**, *since all the commands are buffered in the queue, it is inherent that the command would be selected from the queue to be executed*).

As per claim 42: the combination discloses a selection using a weighted round robin (**see Edsall [0059]-[0060]**, *there are multiple queue to choose the instruction from, since there is a quality of service issue, the packets in the higher priority queue will be weighted heavier to be chosen first*).

As per claim 43: the combination discloses said command type is a read command (**see Kuik column 3, lines 24-49 and column 10, lines 15-35, the system is accessing a storage device, it is inherent that read and write commands are being sent to the storage device)**.

As per claim 44: the combination discloses said amount of data to be transferred is determined by an available space parameter (**see Bono [0040]**).

As per claim 45: the combination discloses said available space parameter defines the number of data bytes to be sent to the host (**see Bono [0040] and [0047]**).

As per claim 46: the combination discloses accessing a storage device using a physical address (**see Kuik column 6, lines 21-42**); retrieving from said accesses storage device the number of bytes designated in said available space parameter **(see Bono [0046]-[0047]**); sending the retrieved data to said host (**see Bono [0047]**); and repeating said steps until all data is read from said storage device **(see Bono [0047])**, *it is inherent the system would continue reading the data off of the storage device and sending it to the host until all the data is retrieved*).

As per claim 47: the combination discloses said physical commands are executed in parallel (**see Kuik column 6, lines 1-7, since one logical target can map to multiple physical devices, it is possible to have the multiple physical devices access the data at the same time**).

As per claim 48: the combination discloses said command type is a write command **(see Kuik column 3, lines 24-49 and column 10, lines 15-35, the system is accessing a storage device, it is inherent that read and write commands are being sent to the storage device)**.

As per claim 50: Kuik discloses a method for performing a plurality of virtualization services, said method being further operative to perform said virtualization services within a data path, comprising: receiving a logic command to be performed on at least one virtual volume, said logic command including at least a virtual address **(see column 6, lines 1-7)**; translating, in one pass, said logic command to a list of physical commands, wherein each of said physical commands is targeted to a different storage

device **(see column 6, lines 1-7, each logical target can be mapped to more than one physical storage device, and column 10, lines 15-35)**; wherein the translation is performed using a mapping information including at least the relations between said at least one virtual volume and its respective logical units (LU's) and storage devices **(see column 6, lines 8-16)**; and executing said physical commands on said storage devices **(see column 7, lines 30-34)**. Kuik fails to disclose scheduling said logic command for execution. Edsall discloses storing frames that are going to be transmitted to the storage devices in a queue (**see [0059]**). Storing the packets in a queue as opposed to directly transmitting them to the storage device allows the storage network to implement a quality of service (**see [0059]**). It would have been obvious to a person having ordinary skill in the art to which said subject matter pertains to have modified Kuik to include a queue to store the packets that are going to be sent to the storage devices, as disclosed by Edsall, to allow the system to implement a quality of service guarantee. The combination of Kuik and Edsall still fail to disclose determining, using a check point list, the amount of data to be transferred across an internet protocol (IP) network, wherein said check point list further defines how data should be sent from an initiator host to said storage device. Bono discloses a technique to increase the performance for accessing a disk array that is attached to a data network through the use of a special data cache arrangement that organizes the data in the cache as a linked list of data chunks **(see [0005]-[0006])**. The cache memory contains a multiple memory list elements that are used to send and receive data instead of copying multiple data fragments **(see [0036])**. These elements are lists of data chucks that together make up

a cache line **(see [0038])**. The system is able to determine how much data is going to be sent across the network through the use of these linked lists **(see [0040]-[0042])**. It would have been obvious to a person having ordinary skill in the art to which said subject matter pertains to have modified the combination of Kuik and Edsall to use the novel cache arrangement disclosed by Bono to reduce the performance penalty of accessing a storage array across a data network.

As per claim 51: said check point list comprises a linked list of data chunks (**see Bono [0040]**).

As per claim 52: filing at least one data chunk with said data retrieved from the network (**see Bono [0043]-[0045]**); accessing said storage device using a physical address (**see Bono [0043]-[0045], it is inherent that the storage device will be accessed with the physical address since the router disclosed by Kuik substituted the physical address for the logical address that was sent by the host**); writing said data chunk to said accessed storage device (**see Bono [0043]-[0045]**; and, repeating said steps for all data chunks in said check point list (*it is inherent that the steps would be repeated until all the data that has been sent out in the packets is written to the storage devices*).

As per claim 53: said physical commands are executed in parallel (**see Kuik column 6, lines 1-7, since one logical target can map to multiple physical devices, it is possible to have the multiple physical devices access the data at the same time**).

As per claim 54: said physical commands are constructed in a data structure (**see Kuik column 4, lines 44-58**).

As per claim 55: said data structure further includes a pointer to said storage device (**see Kuik column 6, lines 8-16**, *the command is parsed and the addresses are translated, therefore the physical address would be the pointer to the storage device*).

As per claim 56: said alternative command link links between at least two physical commands that can be executed in parallel (**see Kuik column 6, lines 1-7**, *the system uses a setup that allows more that one physical device to be mapped to a logical unit, therefore, it is inherent that there is a data structure that indicates what commands can be executed in parallel to fully utilize the increased throughput that this setup provides*).

As per claim 68: Kuik discloses a computer executable code for performing a plurality of virtualization services on a recordable media, said computer executable code being further operative to perform said virtualization services within a data path, comprising: initiating a internet small computer storage interface (iSCSI) with at least an initiator host **(see column 4, lines 35-43)**; receiving a logic command from said initiator host over an internet protocol (IP) network **(see column 4, lines 44-58)**, said logic command including at least a virtual address of at least one virtual volume **(see column 6, lines 1-7)** determining if said initiator host is authorized to execute said logic command; denying said logic command from said initiator host is said initiator host is unauthorized **(see column 5, lines 1-21)**; parsing said logic command to determine at

least said virtual address and said logic commands type **(see column 6, lines 21-42 and column 10, lines 15-35)**; translating, in one pass, said logic command to a list of physical commands, wherein each of said physical commands is targeted to a different storage device **(see column 6, lines 1-7, each logical target can be mapped to more than one physical storage device, and column 10, lines 15-35)**; wherein the translation is performed using a mapping information including at least the relations between said at least one virtual volume and its respective logical units (LU's) and storage devices **(see column 6, lines 8-16)**; and executing said physical commands on said storage devices **(see column 7, lines 30-34)**. Kuik fails to disclose the limitation of performing a check to determine if said logic command is valid and generating a response command if said logic command is invalid. Having a system perform a check on commands that the system receives to determine if the command is valid is well known in the art, and Official Notice is hereby taken. The system would need to check every command it receives since the system would only be capable of processing commands that are known, valid, and not ones that are unknown, invalid. It would have been obvious to a person having ordinary skill in the art to which said subject matter pertains to have modified the system disclosed by Kuik to determine if the received commands are valid or invalid and to notify the sender if an invalid command is received. Kuik still fails to disclose adding said logic command to a host-logical unit (LU) queue. Edsall discloses storing frames that are going to be transmitted to the storage devices in a queue (**see [0059]**). Storing the packets in a queue as opposed to directly transmitting them to the storage device allows the storage network to implement

a quality of service (**see [0059]**). It would have been obvious to a person having ordinary skill in the art to which said subject matter pertains to have modified Kuik to include a queue to store the packets that are going to be sent to the storage devices, as disclosed by Edsall, to allow the system to implement a quality of service guarantee. The combination of Kuik and Edsall still fail to disclose determining, using a check point list, the amount of data to be transferred across said IP network, wherein the check point list includes a linked list of data chunks. Bono discloses a technique to increase the performance for accessing a disk array that is attached to a data network through the use of a special data cache arrangement that organizes the data in the cache as a linked list of data chunks **(see [0005]-[0006])**. The cache memory contains a multiple memory list elements that are used to send and receive data instead of copying multiple data fragments **(see [0036])**. These elements are lists of data chucks that together make up a cache line **(see [0038])**. The system is able to determine how much data is going to be sent across the network through the use of these linked lists **(see [0040]-[0042])**. It would have been obvious to a person having ordinary skill in the art to which said subject matter pertains to have modified the combination of Kuik and Edsall to use the novel cache arrangement disclosed by Bono to reduce the performance penalty of accessing a storage array across a data network.

As per claim 80: Kuik discloses a computer product stored on a computer readable medium comprising software instructions operable to enable a computer to perform a process for performing a plurality of virtualization services, said process being

further operative to perform said virtualizations services within a data path, comprising: receiving a logic command to be performed on at least one virtual volume, said logic command including at least a virtual address of at least one virtual volume **(see column 6, lines 1-7)**; translating, in one pass, said logic command to a list of physical commands, wherein each of said physical commands is targeted to a different storage device **(see column 6, lines 1-7, each logical target can be mapped to more than one physical storage device, and column 10, lines 15-35)**; wherein the translation is performed using a mapping information including at least the relations between said at least one virtual volume and its respective logical units (LU's) and storage devices **(see column 6, lines 8-16)**; and executing said physical commands on said storage devices **(see column 7, lines 30-34)**. Kuik fails to disclose scheduling said logic command for execution. Edsall discloses storing frames that are going to be transmitted to the storage devices in a queue (**see [0059]**). Storing the packets in a queue as opposed to directly transmitting them to the storage device allows the storage network to implement a quality of service (**see [0059]**). It would have been obvious to a person having ordinary skill in the art to which said subject matter pertains to have modified Kuik to include a queue to store the packets that are going to be sent to the storage devices, as disclosed by Edsall, to allow the system to implement a quality of service guarantee. The combination of Kuik and Edsall still fail to disclose determining, using a check point list, the amount of data to be transferred across an internet protocol (IP) network, wherein said check point list further defines how data should be sent from an initiator host to said storage device. Bono discloses a technique to increase the performance

for accessing a disk array that is attached to a data network through the use of a special data cache arrangement that organizes the data in the cache as a linked list of data chunks **(see [0005]-[0006])**. The cache memory contains a multiple memory list elements that are used to send and receive data instead of copying multiple data fragments **(see [0036])**. These elements are lists of data chucks that together make up a cache line **(see [0038])**. The system is able to determine how much data is going to be sent across the network through the use of these linked lists **(see [0040]-[0042])**. It would have been obvious to a person having ordinary skill in the art to which said subject matter pertains to have modified the combination of Kuik and Edsall to use the novel cache arrangement disclosed by Bono to reduce the performance penalty of accessing a storage array across a data network.

As per claim 81: said check point list comprises a linked list of data chunks (**see Bono [0040]**).

As per claim 82: filing at least one data chunk with said data retrieved from the network (**see Bono [0043]-[0045]**); accessing said storage device using a physical address (**see Bono [0043]-[0045], it is inherent that the storage device will be accessed with the physical address since the router disclosed by Kuik substituted the physical address for the logical address that was sent by the host**); writing said data chunk to said accessed storage device (**see Bono [0043]-[0045]**; and, repeating said steps for all data chunks in said check point list (*it is inherent that the steps would be repeated until all the data that has been sent out in the packets is written to the storage devices*).

As per claim 83: said physical commands are executed in parallel (**see Kuik column 6, lines 1-7, since one logical target can map to multiple physical devices, it is possible to have the multiple physical devices access the data at the same time**).

As per claim 84: said physical commands are constructed in a data structure (**see Kuik column 4, lines 44-58**).

As per claim 85: said data structure further includes a pointer to said storage device (**see Kuik column 6, lines 8-16**, *the command is parsed and the addresses are translated, therefore the physical address would be the pointer to the storage device*).

As per claim 86: said alternative command link links between at least two physical commands that can be executed in parallel (**see Kuik column 6, lines 1-7**, *the system uses a setup that allows more that one physical device to be mapped to a logical unit, therefore, it is inherent that there is a data structure that indicates what commands can be executed in parallel to fully utilize the increased throughput that this setup provides*).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edward J. Dudek whose telephone number is 571-270-1030. The examiner can normally be reached on Mon thru Thur 7:30-5:00pm Sec. Fri 7:30-4 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Kim can be reached on 571-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Matt Kim/
Supervisory Patent Examiner, Art Unit 2186

/E. J. D./
Examiner, Art Unit 2186
January 30, 2009